

Use of Metallic Contact

177

In the contrary direction to that they are inclined to follow, that its own current may have free course. If the dominant action at *y* be removed by making metallic contact there, then the liquid at *x* resumes its power; or if the metals be not brought into contact at *y*, but the affinities of the solution there weakened, whilst those active at *x* are strengthened, then the latter gains the ascendancy, and the decompositions are produced in a contrary order.

627. Before drawing a *final* conclusion from this mutual dependence and state of the chemical affinities of two distant portions of acting fluids (651), I will proceed to examine more minutely the various circumstances under which the reaction of the body suffering decomposition is rendered evident upon the action of the body, also undergoing decomposition, which produces the voltaic current.

628. The use of *metallic contact* in a single pair of plates, and the cause of its great superiority above contact made by other kinds of matter, become now very evident. When an amalgamated zinc plate is dipped into dilute sulphuric acid, the force of chemical affinity exerted between the metal and the fluid is not sufficiently powerful to cause sensible action at the surfaces of contact, and occasion the decomposition of water by the oxidation of the metal, although it *is* sufficient to produce such a condition of the electricity (or the power upon which chemical affinity depends) as would produce a current if there were a path open for it (651, 691); and that current would complete the conditions necessary, under the circumstances, for the decomposition of the water.

629. Now the presence of a piece of platina touching both the zinc and the fluid to be decomposed, opens the path required for the electricity. Its *direct communication* with the zinc is effectual, far beyond any communication made between it and that metal (*i.e.* between the platina and zinc), by means of decomposable conducting bodies, or, in other words, *electrolytes*, as in the experiment already described (626); because, when *they* are used, the chemical affinities between them and the zinc produce a contrary and opposing action to that which

Is influential in the dilute sulphuric acid; or if that action be but small, still the affinity of their component parts for each other has to be overcome, for they cannot conduct without suffering decomposition; and this decomposition is found *experimentally* to react back upon the forces which in the acid tend to produce the current (639, 645, etc.), and in numerous cases

M